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# **INDIANA**

# **Epidemiology**

# **NEWSLETTER**

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Epidemiology Resource Center  
2 North Meridian Street, 3-D  
Indianapolis, IN 46204  
317/233-7416

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## **Immunization Difficulties in a Medical Practice**

Charlene Graves, M.D.  
ISDH Medical Director, Immunization Program



A family physician group practice in Sullivan, Indiana identified the possible failure of a nurse in their office to administer injections appropriately. The concerns were noted in July 2000 after several patients allegedly complained they felt they had not received injectable medications because of the absence of usual local side effects experienced from having had previous injections of these medications. This nurse had a longstanding reputation as the staff nurse who gave quick and painless shots. Some parents also noted that their children may not have received vaccines because of lack of pain associated with the usual administration of some immunizations. Upon further investigation and checking of the syringe/needle ("sharp") disposal boxes in patient rooms, incompletely emptied MMR single-dose vials were found in the room used by the

nurse in question. Serologic testing for measles antibodies was then performed on nine children who had received some vaccines from this nurse – all had antibody levels much lower than expected. The nurse was dismissed from her duties in August 2000 and reported to the State Nursing Board.

The group practice was established in October 1995 and has about 30,000 patients. It is the only private provider of childhood immunizations in the county, with an estimated 2,500 children aged 0-16 years served through the practice. The Indiana State Department of Health (ISDH) was informed of the concerns about possible failure to vaccinate in September 2000

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and invited consultation from the Centers for Disease Control and Prevention (CDC) to assist in evaluating immunization practices and levels of immunity for children in the practice. On September 26, Dr. Joanne Cono and Dr. Idalia Gonzalez of the Epidemiologic Intelligence Service of CDC traveled to Indiana to provide this assistance.



Since the group practice had maintained computerized billing records since 1995, a list of patients born between January 1984 and September 2000 was generated to find all patients ages 0-16 who may have received vaccines from the nurse. Because the nurse worked predominantly with one physician in the practice the investigation focused heavily on that physician's identified patients. From this group, for children 0-6 years of age, 135/139 (97%) of charts were available for review. A sample of 46/185 (25%) of charts of children 7-16 years of age was also reviewed. The nursing practice in the office was to initial and record each dose of vaccine on the immunization record portion of each patient's chart immediately after administration of each dose of vaccine.

All group practice additional charts of children 0-16 years of age were reviewed and any chart showing administration of any dose of vaccine by the nurse, or any chart where a nurse's initial was not present, was assumed to be a possible exposure to this nurse's suspect immunization methods.

A total of 2,445 out of 2,484 (98.4%) patient records from 0-16 years of age were reviewed for immunization data. It was found that 43.5% of patients of one physician (whom the nurse worked with most of the time) as compared to between 4.3% to 6.6% of patients of the other three physicians had received immunizations from the nurse. This was a total of 407 child/adolescent patients or 16.6% of all providers' patients who were registered in the practice's computer system between 1995 and 2000.

Sixty percent of the children in the practice of one provider, who were 7-16 years of age, were more likely to have received all their immunizations from the nurse, compared to 14.8% of the younger children. In addition, two-thirds of older children in this group were more likely to have received two or more doses of DTP/DTaP vaccine from the nurse, compared to 31% of younger children. It should be noted that the nurse worked exclusively with one physician from 1989 to 1995 and only cross-covered occasionally for the other providers after the four-physician practice was formed in 1995, so these results are to be expected.



After discussions between the physicians and nurse-manager of the practice, ISDH Immunization Program staff, and CDC physicians, a plan was developed for providing protection against vaccine-preventable diseases. This focused on obtaining serologic testing on each patient who had received two or more DTaP/DTP/Td immunizations from the nurse, because of the possible side effects (local reactions) associated with giving additional doses of those vaccines to someone who already had sufficient immunity. For all other antigens, patients at-risk were to have repeat immunizations administered (based on the current age, results of serologic testing when available, and current ACIP/AAP/AAFP guidelines) after being offered serologic testing if they desired. Refusal of serologic testing would not interfere with receiving repeat immunizations. Families could also refuse repeat immunizations after being counseled on the risks of contracting vaccine-preventable diseases. All revaccinations were to be recorded in patient charts on a new vaccine administration record page and the previous records were to remain in the chart as well, without cross-outs or erasures.

As part of the plan to remedy the probable lack of immunization of some patients, several attempts were made to contact patients who needed repeat immunization by various methods. There was broad media coverage of the need to re-evaluate and re-immunize patients. Signs were placed in the practice office soliciting patient reporting of any concerns they had regarding immunizations that had been received. Certified letters were sent out in November to locate a small number of patients who had not responded to previous attempted contacts.

Results: 147 samples were sent to the University of Rochester for diphtheria and tetanus titers and 57 samples went to CDC for measles IgG titers. CDC interpreted the results of the serologic testing, which was then sent back to the practice. Birth dates of children with negative measles IgG titers ranged from 1990 to 2000; 8 were born between 1990 –95 and 11 were born from 1996-2000. There was an even distribution of males and females in that group.

Antibody Titers	Positive		Negative		Total
	No.	%	No.	%	No.
Measles IgG	38	66.6	19	33.3	57
Diphtheria	118	80.3	29	19.7	147
Tetanus	127	86.4	20	13.6	147

Of 19 children with negative measles IgG titers, 8 also had negative titers for both diphtheria and tetanus, and 1 additional patient had a negative titer for diphtheria alone. Of 29 children with negative diphtheria titers, 15 also had negative tetanus titers.

These data indicate that one-third of children were not adequately immunized against measles and about one-fifth of children were not protected against diphtheria. Insufficient protection against tetanus was not as evident, which may be a function of children receiving tetanus toxoid related to wound care by other health care providers. There appears to be no particular pattern of selection of children of a specific age or gender, or of a combination of immunizations, as a selected target for the questionable immunization practices of the nurse.

The practice continues to offer repeat immunizations and review of the immunization records on both pediatric and adult patients as they present at the office for ongoing care.

**Comment:** This investigation was assisted greatly by the fact that the practice had computerized billing records that could be used to identify the patient population under consideration, having all immunizations recorded in one specified area of the patient charts, and the nursing practice of documenting which nurse gave each immunization by initialing the chart accordingly.

## References:

EPI-AID 2000-71-1, *Possible Failure to Vaccinate Children in a Medical Practice*, December 4, 2000 Report by Dr. Idalia Gonzales and Dr. Shawn McMahon, CDC

*Use of Diphtheria Toxoid-Tetanus Toxoid-Acellular Pertussis Vaccine as a Five-Dose Series: Supplemental Recommendations of the ACIP*, MMWR 2000; 49 (No. RR-13)

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# Stroke: Know the Facts!

Elizabeth L. Hamilton-Byrd, M.D.  
Medical Epidemiologist  
ISDH Epidemiology Resource Center

An acute **stroke** is a medical **emergency**. If you or someone near you has the onset of stroke symptoms, **call 911**. It could save a life and reduce disability. There is now treatment available that is effective for the most common type of stroke, but as with the use of clot-busting drugs in the treatment of heart attack, treatment needs to be given within 3 hours of the onset of stroke symptoms. Know the symptoms of stroke. If you recognize those symptoms in yourself or another person, **DON'T DELAY; calling 911 immediately can save valuable minutes.**



The warning signs of stroke appear **suddenly**. Any **one** (or more) of the following symptoms could indicate a stroke.

- ▶ Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body. You may have difficulty moving one arm or notice that one side of your face droops.
- ▶ Sudden confusion, trouble speaking, or understanding speech and written information. Other people may be unable to understand you when you talk.
- ▶ Sudden difficulty seeing in one or both eyes.
- ▶ Sudden trouble walking, dizziness, loss of balance or coordination. You may fall without any apparent cause.
- ▶ Sudden severe headache with no known cause. Even if you often have headaches, a sudden headache that is different from or stronger than your usual headache could signal a stroke.



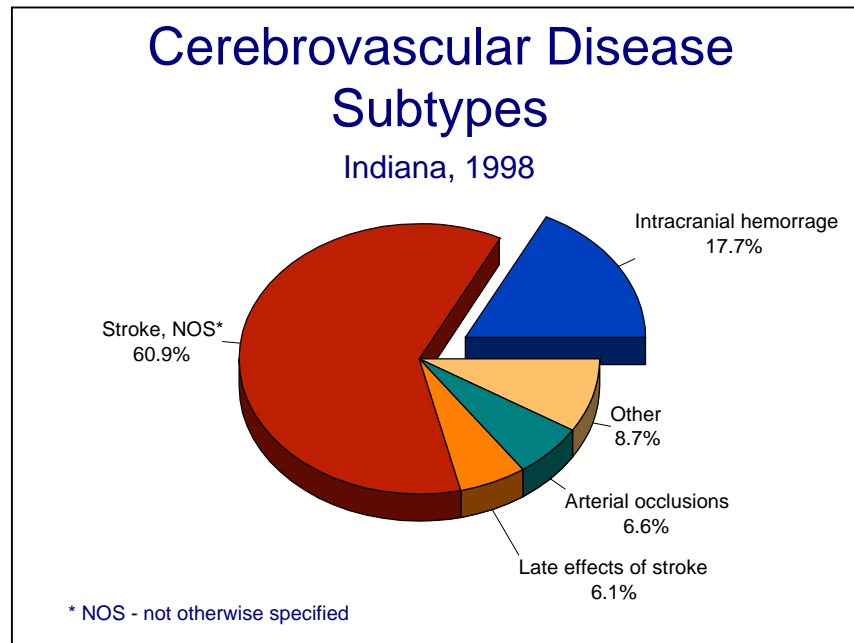
Cerebrovascular disease (disease involving the blood supply to the brain) is the third leading cause of death in Indiana and in the United States. Stroke, also called cerebrovascular accident (CVA) accounts for the vast majority (more than 80%) of cerebrovascular disease. The other cerebrovascular diseases are diseases of the blood vessels of the brain, all of which directly increase the risk for stroke. In 1998, cerebrovascular disease was the underlying cause of death for 3,886 Indiana residents.

## Classification

Strokes occur when the blood supply to a part of the brain is interrupted. This may occur when an artery supplying part of the brain is blocked by blood or cholesterol clots (ischemic stroke/cerebral infarct) or when a weakness or tear in an artery allows bleeding into the tissue of the brain (hemorrhagic stroke). Thrombosis (blood clot formation) may also occur in the venous sinuses and superficial or deep cerebral veins. Bleeding from arteries and veins may also occur between the membranous coverings (meninges) of the brain. Epidural hematomas (bleeding between the skull and the outer covering, dura mater, of the brain) and subdural hematomas (bleeding beneath the outermost covering or dura) are most often due to trauma, but occasionally occur spontaneously. They are considered with cerebrovascular disease for classification of mortality only when they are not the result of trauma. The onset of symptoms for epidural and particularly subdural hematomas is generally more gradual than that of stroke. Bleeding under the middle layer of the meninges, subarachnoid hemorrhage, is most often the result of the rupture of a cerebral aneurysm (a localized dilation or distension of an artery). The onset of symptoms is sudden and subarachnoid hemorrhages are often considered a type of hemorrhagic stroke.

Cerebral infarction or ischemic stroke is the most common stroke subtype, comprising approximately 75–80 % of all strokes. This percentage cannot be derived from mortality data as the type of stroke/CVA is not listed in about two-thirds of strokes reported as the underlying cause of death on the death certificate. Intracranial hemorrhage, which includes intracerebral hemorrhage, subarachnoid hemorrhage, and nontraumatic epidural and subdural hematoma, accounts for 17.7% of reported fatal cerebrovascular disease.

**Figure 1.**



## Risk Factors

Risk factors are personal characteristics and behaviors that increase the chances of getting a particular disease. Risk factors for stroke, as for most chronic diseases, can be divided into three groups:

1. factors that cannot be controlled
2. personal behaviors or lifestyle factors
3. factors that can be modified, treated, or controlled with the help of a doctor

### Risk factors that cannot be controlled

- ▶ **Increasing age.** Stroke occurs in all age groups even infants. In 1998, there were 26 fatal strokes in Indiana residents less than 35 years old. However, the risk of stroke more than doubles for each ten years of life after age 55.
- ▶ **Sex.** In 1998 in Indiana, the age-adjusted death rate from stroke was higher for men (28.9/100,000) than for women (27.0/100,000). Thus, men die from stroke on average at a younger age than women do. However, in 1998 in Indiana, more women died of stroke (2,456 deaths) than did men (1,430 deaths).
- ▶ **Race.** African-Americans have a much higher risk of dying from a stroke than do white Americans. The risk of stroke is also higher for Hispanics.
- ▶ **Family history.** The chance of having a stroke is greater for people who have a family history of stroke.
- ▶ **Prior stroke.** If someone has already had a stroke, the risk of having another stroke is much greater than the risk of stroke for someone who has not had one.

## Risk factors requiring a lifestyle/behavior change

- ▶ **Cigarette smoking.** Use of tobacco products of all types increases the risk of cardiovascular disease. Cigarette smoking in women using some oral contraceptives markedly increases their risk of stroke.
- ▶ **Physical inactivity.** Regular physical activity can reduce the risk of heart disease, heart attack, and stroke. Even mild to moderate intensity activity such as walking provides health benefits. Thirty minutes of moderate-intensity activity on most days of the week or twenty minutes of vigorous physical activity three days per week are recommended amounts for good health.
- ▶ **Obesity and overweight.** Excess body fat, especially around the waist, increases the risk of high blood pressure, diabetes, heart disease, and stroke.
- ▶ **Excessive alcohol drinking.** Binge drinking and drinking an average of more than one drink a day for women or two drinks a day for men can lead to high blood pressure, obesity, heart disease, and stroke.
- ▶ **Illegal drug use.** Intravenous and other injecting drug use leads to a high risk of stroke. Cocaine and methamphetamine use can cause stroke even for first-time users.

## Factors which can be altered with medical care

- ▶ **High blood pressure.** Hypertension is the single most important treatable risk factor for stroke. Blood pressure is measured by two numbers. The top number, systolic blood pressure, should be less than 140. The bottom number, diastolic blood pressure, should be under 90. Blood pressure that remains at or above this level is considered high blood pressure.
- ▶ **Diabetes mellitus.** Diabetes is a disease in which the body either does not make or respond normally to the hormone insulin, leading to an increased level of glucose (sugar) in the blood. Diabetes increases the risk of heart disease and stroke. Treatment to keep blood sugar in the normal range will reduce, though not eliminate, the increased risk for cardiovascular diseases.
- ▶ **Heart disease.** People with heart disease have a more than doubled risk of stroke. This is especially true for those who have atrial fibrillation, a rapid uncontrolled quivering of the upper chambers (atria) of the heart. The major cause of death for those who survive a stroke is heart attack.
- ▶ **Transient ischemic attacks (TIAs).** TIAs are “mini-strokes”, in which the symptoms of a stroke completely disappear in a short time. People who have had a TIA have an almost 10 times increased chance of having a stroke. Treat TIAs just like stroke - as an emergency.
- ▶ **Carotid artery disease.** The carotid arteries are the large arteries in the neck, which carry blood from the heart to the brain. When deposits of fatty plaque (atherosclerosis) narrow these arteries, they may be blocked by a blood clot causing a stroke.

## Treatment



A little over five years ago, there was little doctors could do to stop a stroke or prevent disability. Lives were still saved by prompt medical attention, intensive care, and in some cases surgery (for example, in bleeding from cerebral aneurysms). The situation has dramatically improved since the approval by the FDA of tissue plasminogen activator (tPA) for treatment of acute ischemic stroke. The treatment must be given within **3 hours** of the onset of stroke symptoms. Unfortunately, the treatment is not used nearly as often as it could be, because most people do not get to the hospital on time. The doctor at the hospital needs time to perform tests to be sure the use of the clot-busting drug (tPA) is appropriate. It can't be used in those who have had a hemorrhagic stroke or those who have a high risk for bleeding. The American Stroke Association, division of the American Heart Association, piloted Operation Stroke, a community awareness and mobilization initiative to improve acute stroke care in 1998. There are now many sites throughout the country. Operation Stroke is currently active in Bloomington, Muncie, and Indianapolis. Expansion to Evansville and Fort Wayne is planned for spring 2001. Remember: **stroke is an emergency – call 911.**



## References

1. American Stroke Association web site: [www.americanheart.org/Heart\\_and\\_Stroke\\_A\\_Z\\_Guide/asa.html](http://www.americanheart.org/Heart_and_Stroke_A_Z_Guide/asa.html)
  2. National Center for Health Statistics web site: [www.cdc.gov/nchs/fastats/stroke.htm](http://www.cdc.gov/nchs/fastats/stroke.htm)
  3. Indiana State Department of Health, Indiana Mortality Report 1998: [www.state.in.us/isdh/dataandstats/mortality/1998/toc.htm](http://www.state.in.us/isdh/dataandstats/mortality/1998/toc.htm)
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## Perinatal Survey Reveals Consistent Policies Needed

Hans Messersmith  
Director, Surveillance Investigation Unit  
ISDH Epidemiology Resource Center

### Introduction

In the months of June through September 2000, the Maternal and Child Health Services program of the Indiana State Department of Health, in association with the Epidemiology Resource Center and the Communicable Disease program, conducted a survey of perinatal policies and practices at hospitals and birthing centers in the state of Indiana. The major goal of the survey was to determine whether hospitals and birthing centers had official policies in place regarding many important areas of concern for perinatal health. These areas were emergency room policy, meconium screening, group B streptococcal disease, hepatitis B, HIV, syphilis, newborn metabolic screening, and universal newborn hearing screening.

### Results

There were 103 hospitals/birthing centers surveyed. The total number of deliveries reported by these facilities in 1999 was 81,185, with a median of 455 deliveries per facility that year. For each of the areas of concern, the following results were found:



- **Hepatitis B:** 56 of the 103 hospitals/birthing centers (54%) had a written policy covering hepatitis B. 34 out of those 56 (61%) had reporting cases of hepatitis B to the ISDH covered in their policy.
- **Group B Streptococcal Disease (GBS):** 51 of the 103 hospitals/birthing centers (50%) had a written policy covering GBS.
- **HIV:** 80 of the 103 hospitals/birthing centers (78%) had a written policy covering HIV. 45 out of those 80 (56%) had reporting of cases of HIV to the ISDH covered in their policy.
- **Syphilis:** 39 of the 103 hospitals/birthing centers (38%) had a written policy covering syphilis.
- **Meconium Screening:** 80 out of 103 hospitals/birthing centers (78%) routinely perform meconium screening. 63 out of these 80 (67%) have a written policy covering this screening. 48 out of the 63 with a written policy (76%) have reporting of the results of these screens to the ISDH.
- **Newborn Metabolic Screening:** 91 out of 103 hospitals/birthing centers (88%) have a written policy covering newborn metabolic screening. 74 out of these 91 (81%) have reporting of these results to the ISD covered in the written policy.
- **Universal Newborn Hearing Screening:** 78 out of 103 hospitals/birthing centers (76%) have instituted universal newborn hearing screening. 63 out of these 78 (81%) have a written policy covering universal newborn hearing screening.
- **Emergency Room Policy:** Table 1 shows the number and percentage of the 103 hospitals/birthing centers that have a written protocol covering that area for pregnant women who visit the emergency room.

**Table 1**  
**Emergency Room Written Protocols**

Area	N	%
Assist the woman into prenatal care	26	25%
Assist the woman into prenatal care coordination	13	13%
Assist the woman to enroll in Medicaid, if applicable	17	17%
Assist the woman to enroll in WIC, if applicable	14	14%
Screen and treat the woman for vaginosis	16	16%
Screen and refer the woman for substance abuse	28	27%
Screen and refer the woman for domestic violence	60	58%
Screen the woman for hepatitis B	14	14%
Screen the woman for HIV	22	21%
Screen the woman for syphilis	17	17%

## ***Discussion***

Many hospitals in the state of Indiana have no written policy governing important areas of perinatal health. In those hospitals, which do have written policies, reporting to the ISDH is often not included in the policy. This is true although in some of these areas (hepatitis B, HIV, newborn metabolic screening, etc.) reporting is mandated by state law or regulation. Of course, just because a written policy is not in place does not mean that appropriate care and correct reporting is not being done in the hospital or birthing center. However, a written policy can help to ensure consistency of care and reporting, and provide needed continuity when staff changes.



The ISDH will use this information to better target our public education efforts to ensure that hospitals and birthing centers in Indiana are providing a consistent level of perinatal care, and are reporting all mandated information.



# Conferences and Seminars

## Indiana University

### *Master of Public Health Program*

The Department of Public Health is now accepting applications for the Master of Public Health (MPH) Program for fall 2001. Housed in the IU School of Medicine, the Department of Public Health is a collaboration with Indiana University, Purdue University, the Indiana State Department of Health, and the Marion County Health Department.

Participants enroll in the three-year, part-time program and select one of the following concentrations:

- ▶ Behavioral Health Sciences
- ▶ Biostatistics
- ▶ Environmental Health
- ▶ Epidemiology
- ▶ Health Policy and Management

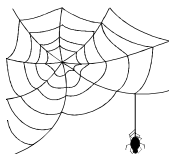
To request an application or additional information, please contact:

[pbhealth@iupui.edu](mailto:pbhealth@iupui.edu)

or

Shawne Mathis at (317) 278-0337

Financial aid questions can be directed to [www.iupui.edu/finaid](http://www.iupui.edu/finaid).



## Wonderful Wide Web Sites

### ISDH Data Reports Available

The ISDH Epidemiology Resource Center has the following data reports and the Indiana Epidemiology Newsletter available on the ISDH Web Page:

<http://www.state.in.us/isdh/> (under Data and Statistics)

Indiana Cancer Incidence Report (1990, 95)	Indiana Mortality Report (1995, 97)
Indiana Cancer Mortality Report (1990-94, 1992-96)	Indiana Natality Report (1995, 96, 97)
Indiana Health Behavior Risk Factors (1995-96, 97, 98)	Indiana Natality/Induced Termination of Pregnancy/Marriage Report (1998)
Indiana Hospital Consumer Guide (1996)	Indiana Report of Diseases of Public Health Interest (1997, 98, 99)
Indiana Marriage Report (1995, 96, 97)	

The following site allows access to the web page for any state health department in the United States:

<http://www.polsci.wvu.edu/grad/klase/STATEHEALTH/sthlth.html>

## HIV Disease Summary

Information as of February 2001 (population 5,840,528)

### HIV - without AIDS to date:

303	New cases from March 2000 thru February 2001	12-month incidence	5.19 cases/100,000
3,303	Total HIV-positive, without AIDS on February 28, 2001 <sup>1</sup>	Point prevalence	56.56 cases/100,000 <sup>1</sup>

### AIDS cases to date:

304	New AIDS cases from March 2000 thru February 2001	12-month incidence	5.21 cases/100,000
2,698	Total AIDS cases on February 28, 2001 <sup>1</sup>	Point prevalence	46.20 cases/100,000 <sup>1</sup>
6,134	Total AIDS cases, cumulative (alive and dead)		

<sup>1</sup>Counting only cases alive in February 2001

## **REPORTED CASES** of selected notifiable diseases

Disease	Cases Reported in February MMWR Weeks 5-8		Cumulative Cases Reported January - February MMWR Weeks 1-8	
	2000	2001	2000	2001
Campylobacteriosis	36	15	44	22
Chlamydia	1,230	1,015	2,001	2,066
<i>E. coli</i> O157:H7	2	4	5	4
Hepatitis A	10	4	12	4
Hepatitis B	4	2	4	2
Invasive Drug Resistant <i>S. pneumoniae</i> (DRSP)	16	26	24	28
Gonorrhea	490	429	916	898
Legionellosis	0	2	1	3
Lyme Disease	0	0	0	0
Meningococcal, invasive	2	0	8	0
Pertussis	4	1	4	1
Rocky Mountain Spotted Fever	0	1	0	1
Salmonellosis	26	24	29	31
Shigellosis	13	28	14	37
Syphilis (Primary and Secondary)	34	13	65	23
Tuberculosis	8	2	17	12
Animal Rabies	0	1 (bat)	0	1 (bat)

**For information on reporting of communicable diseases in Indiana,  
call the *ISDH Communicable Disease Division* at (317) 233-7665.**

**Indiana**  
***Epidemiology***  
**Newsletter**

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*State Health Commissioner*  
Gregory A. Wilson, MD

*Deputy State Health Commissioner*  
Mary DePrez

*State Epidemiologist*  
Robert Teclaw, DVM, MPH, PhD

*Editor*  
Pam Pontones, MA, RM(AAM)

*Contributing Authors:*  
Charlene Graves, MD  
Hans Messersmith  
E.L. Hamilton-Byrd, MD

*Design/Layout*  
Cheryl Thomas